

REMARKS

1. The claims 1-8, 13, 16-18, 20, 27-31, 33-35, 37, 38, 40, 43-49 and 52-61, which were rejected by the Examiner, have been canceled.
2. The claims 9-12, which were rejected to as being indefinite, have been re-written to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in the Office action and to include all of the limitations of the base claim and any intervening claims except that: (1) the phrases “such as a coffee or tea brewing station” in line 2, “predetermined” in line 8, “close to said port” in line 13, and “in such a manner station” in lines 15-18 of claim 1 have been deleted; (2) the phrase “sleeve” in line 1 of claim 8 and line 2 of claim 9 has been amended to “partition”; (3) the phrase “located ... for allowing” in line 2 of claim 10 has been amended to “that allows”; and (4) the phrase “said lower ... opening” in lines 3-4 of claim 10 has been deleted.
3. The claims 14 and 15, which were also rejected to as being indefinite, have been re-written to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in the Office action and to include all of the limitations of the base claim and any intervening claims except that: (1) the phrases “such as a coffee or tea brewing station” in line 2, “predetermined” in line 8, “and for heating.....station” in lines 8 and 9, “close to..... port” in line 13, and “in such a manner utilization station” in lines 15-18 of claim 1, have been deleted; (2) the phrases “hot water”, “water heating chamber” and “above” have been amended to “water”, “water chamber” and “near” respectively throughout claims; (3) the phrase “water heating tube” of claim 15 has been amended to “water heating chamber” throughout the claim; and (4) the phrase “said water heating... said tube” in lines 5-7 of claim 15 has been deleted.
4. The claim 19, which were also rejected to as being indefinite, have been re-written to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in the Office action and to include all of the limitations of the base claim and any intervening claims except that: (1) the phrases “such as a coffee ... station” in line 2, “predetermined” in line 8, “and for heating.....station” in lines 8 and 9, “close to..... port” in line 13, and “in such a manner station” in lines 15-18 of claim 1 have been deleted; (2) the phrases “hot water” and “water heating chamber” have been amended to “water” and “water chamber” respectively throughout the claim; and (3) the phrase “one ...outlet for” in line 2 of claim 19 has been deleted.

5. The claims 21-26, which are objected to as being dependent upon a rejected base claim, has been re-written in independent form including all of the limitations of the base claim and any intervening claims except that: (1) the phrase “container” has been amended to “utilization station”; (2) the phrases “predetermined” and “automatically” have been deleted; (3) the phrases “such as water pulse ” in line 1, “adapted to receive... system” in line 3, “into a container ... water” in lines 4 and 5, “in said chamber ...therein” in lines 19-20, and “chamber when the chamber temperature” in line 21 of claim 20 have been amended to “by delivering ... station”, “connected to system”, “to the hot water ... beverage”, “to deliver hot water in said chamber”, and “pulse generator ... generator”, respectively; (4) the phrases “when the pressure ... pressure” in lines 11-12 and “wherein said pulse ... a drink” in lines 24-30 of claim 20 have been deleted; (5) the phrase “thereby ... to the container” in lines 3-5 of claim 22 has been deleted; (6) the phrase “approximately” has been added before “said first temperature” in line 7 of claim 23; and (7) the phrases “comprises a thermostat” in line 2, “pressure controller” in line 3 and “thermostat” in line 4 of claim 24 have been amended to “and pressure controller comprises”, “delivery heater” and “switch”, respectively.

6. The claim 32, which is also objected to as being dependent upon a rejected base claim, has been re-written in independent form including all of the limitations of the base claim and any intervening claims except that: (1) the phrase “container” has been amended to “utilization station”; (2) the phrases “predetermined” and “automatically” has been deleted; (3) the phrases “such as water pulse ” in line 1, “adapted to receive... system” in line 3, “into a container ... water” in lines 4 and 5, “in said chamber ...therein” in lines 19-20, and “chamber when the chamber temperature” in line 21 of claim 20 have been amended to “by delivering ... station”, “for receiving water”, “to the hot water ... beverage”, “to deliver hot water in said chamber”, and “pulse generator ... generator”, respectively; (4) the phrases “a filling under pressure” in lines 10-14 and “wherein said pulse ... a drink” in lines 24-30 of claim 20 have been deleted; and (5) the phrase “between said filling valve and” of claim 32 has been amended to “in or near”.

7. The claim 36, which has been allowed, is the same as the original claim.

8. The claims 39, 41 and 42, which are also objected to as being dependent upon a rejected base claim, has been re-written in independent form including all of the limitations of the base claim and any intervening claims except that: (1) the phrases “when the pressure pressure” in lines 12-13, “substantially without water pulse” in lines 17-20 and “for the generation system” in lines 22-23 of claim 37 have been deleted; (2) the phrase “adapted to allow also adapted” in

lines 3-4 of claim 38 has been deleted; (3) the phrase “between said filling valve and” in lines 1-2 of claim 40 has been deleted; and (4) the phrase “a tube comprising being” in lines 1-2 of claim 41 has been deleted.

9. The claim 50, which has been allowed, is the same as the original claims without changes.
10. The claim 51, which has also been allowed, has been amended by changing “in claim 51” in line 1 to “in claim 50”.
11. The claims 62 and 63, which are also objected to as being dependent upon a rejected base claim, has been re-written in independent form including all of the limitations of the base claim and any intervening claims except that: (1) the phrase “instantly” has been deleted throughout the claim; (2) the phrase “adapted to receive allowing” in lines 5-6 of claim 55 has been amended to “for receiving for allowing; (3) the phrase “a significantly smaller utilization station” in lines 8-11 of claim 55 has been amended to “a substantially smaller utilization station; (4) the phrase “as the water steam” in lines 13-14 of claim 55 has been deleted; and (5) the phrases “substantially wall” in lines 1-2 and “heating” in line 3 of claim 62 have been amended to “partition” and “mixing with”, respectively.
12. The claim 64, which was rejected to as being there was no antecedent basis for the “cover”, has been re-written to be dependent in the amended claim 63. There is an antecedent “cover” in line 14 of the amended claim 63.
13. Four new dependent claims 65-68, which are dependent on the now allowable base claim 9, have been added to more accurately and closely define the invention.

Claim 65 further teaches a heating controller for keeping the water in the heating chamber between a first temperature and a second temperature. Both the first and second temperatures are below water boiling point. Some of the support for this claim may be found in Page 5, lines 14-16 of the application.

Claim 66 is a dependent claim of claim 65 and further teaches to reduce the difference between the first and second temperatures by locating a thermostat of the heating controller at the lowest part of the heating chamber. Some of the support for this claim may be found in Page 8, lines 23-28 and Page 10, line 5-9 of the application.

Claim 67 further teaches a filling valve and a reservoir for facilitating the refill of the pulse generator and the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 4, lines 29-32; Page 5, lines 1-8 and Fig. 1 of the application.

Claim 68 further teaches a relief valve for keeping the heating chamber open to atmosphere and facilitating the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 6, lines 29-33; Page 7, lines 1-22 and Fig. 1 of the application.

14. Five new dependent claims 69-73, which are dependent on the allowed base claim 14, have been added to more accurately and closely define the invention.

Claim 69 further teaches to reduce the heating of the water in the water chamber by steam by maintaining an intact steam/water interface. Some of the support for this claim may be found in Page 14, lines 21-24 and Fig. 8 of the application.

Claim 70 further teaches a filling valve and a reservoir for facilitating the refill of the pulse generator and the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 4, lines 29-32; Page 5, lines 1-8; Page 14, lines 14-20 and Figs. 1 and 8 of the application.

Claim 71 is a dependent claim of claim 70 and further teaches an assistant valve located downstream of the water intake port for preventing air from entering the water chamber. Some of the support for this claim may be found in Page 14, lines 33-34 and Page 15, line 1-8 of the application.

Claim 72 further teaches a shield located next to the heater for saving energy and increasing the delivery speed for the pressurized liquid pulse. Some of the support for this claim may be found in Page 14, lines 14-20 of the application.

Claim 72 further teaches to use the pressurized water pulse for decoration, cleaning, motion device and massager. Some of the support for this claim may be found in Page 15, lines 4-9 of the application.

15. Five new dependent claims 74-78, which are dependent on the now allowable base claim 21, have been added to more accurately and closely define the invention.

Claim 74 further teaches to reduce the difference between the first and second temperatures by locating a thermostat of the heating controller at the lowest part of the heating chamber. Some of

the support for this claim may be found in Page 8, lines 23-28 and Page 10, line 5-9 of the application.

Claim 75 further teaches to keep the water in the heating chamber below water boiling point at 170 to 210° F. Some of the support for this claim may be found in Page 5, lines 14-16 of the application.

Claim 76 further teaches to enable the generator to meter one water pulse at a time to the utilization station by allowing the pressure controller to turn off the delivery heater substantially before the end of the water pulse. Some of the support for this claim may be found in Page 8, lines 29-32 of the application.

Claim 77 further teaches to a relief valve for keeping the heating chamber open to atmosphere and facilitating the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 6, lines 29-33; Page 7, lines 1-22 and Fig. 1 of the application.

Claim 78 further teaches to add a sufficiently horizontal and thin chamber between the reservoir and the filling valve to prevent the water in the reservoir from becoming heated by the heating chamber. Some of the support for this claim may be found in Page 11, lines 17-22 and Fig. 6 of the application.

16. Two new dependent claims 79-80, which are dependent on the now allowable base claim 32, have been added to more accurately and closely define the invention.

Claim 79 further teaches a second heater and to locate it at the bottom of the chamber to maintain the water temperature between the first and second temperatures. Some of the support for this claim may be found in Page 4, lines 22-27 and Figs. 1 and 7 of the application.

Claim 80 further teaches a filling valve and a reservoir for facilitating the refill of the pulse generator and the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 4, lines 29-32; Page 5, lines 1-8; Page 14, lines 14-20 and Figs. 1 and 8 of the application.

17. One new dependent claim 81, which is dependent on the now allowable base claim 41, has been added to more accurately and closely define the invention.

Claim 81 further teaches that the elongated chamber comprises a tube with at least one of a bent section and a horizontal section. Some of the support for this claim may be found in Page 14, lines 21-24 and Fig. 8 of the application.

18. Six new dependent claims 82-87, which are dependent on the now allowable base claim 62, have been added to more accurately and closely define the invention.

Claim 82 further teaches a chamber opening located in the lower part of the water chamber for allowing water to flow into the pressurization chamber as the water therein is vaporized into steam. Some of the support for the claim may be found in Page 16, lines 22-24 and Fig. 10 of the application.

Claim 83 is a dependent claim of claim 82 and further teaches to remove the calcium scale by making the chamber opening sufficiently large. Some of the support for this claim may be found in Page 6, lines 3-7 of the application.

Claim 84 is also a dependent claim of claim 82 and further teaches to facilitate the water flow into the pressurization chamber with an opening on the pressurization chamber to introduce steam to the top end of the water chamber during the generation of the steam. Some of the support for this claim may be found in Page 13, lines 32-34 and the opening 28 on plate 27 in Fig. 10 of the application.

Claim 85 further teaches have the inlet function as the steam outlet. Some of the support for this claim may be found in Page 16, lines 29-31 of the application.

Claim 86 is a dependent claim of claim 85 and further teaches to outwardly taper the inlet to make it safer for the steam to contact a person or an object. Some of the support for this claim may be found in Page 16, lines 32-33 of the application.

Claim 87 further teaches a filling valve and a reservoir for facilitating the refill of the pulse generator and the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 4, lines 29-32; Page 5, lines 1-8; Page 14, lines 14-20; and Figs. 1 and 10 of the application.

19. Two new independent claims 88 and 92, and seven new dependent claims 89-91 and 93-97 have been added to better and more clearly define the invention.

20. Claim 88 teaches to enable a liquid pulse generator to deliver two or more different sizes of liquid pulses to a utilization station. Specifically, the invention teaches to vary the size of the liquid pulse to be delivered by varying the location of a liquid intake port in a liquid chamber. The pressurized gas generated in or introduced into the chamber forces the liquid above the liquid intake port in the

liquid chamber as a liquid pulse. Such a capability to vary the size of the liquid pulse is especially useful in beverage making since different people want different cup sizes, and has resolved one of the main obstacles to the commercial success of the earlier pulse generators taught by the inventor in US Patent Nos. 5,267,506 and 6,405,637.

To help advance prosecution, some of the support for this claim may be found in Page 12, lines 12-24; Page 9, lines 27-31; Page 7, lines 28-34; and Fig. 6 of the application.

21. Claims 89-91 are dependable claims of claim 88.

Claim 89 further teaches a filling valve and a reservoir for facilitating the refill of the pulse generator and the delivery of the pressurized water pulse. Some of the support for this claim may be found in Page 4, lines 29-32; Page 5, lines 1-8 and Fig. 1 of the application.

Claim 90 further teaches a heating system having a heater for heating water to generate pressurized steam as the pressurized gas to deliver the amount of liquid above the liquid intake port in the liquid chamber to the utilization station. Some of the support for this claim may be found in Page 12, lines 12-24; Page 11, lines 12-16; Page 7, lines 28-34; and Figs. 6 and 2 of the application.

Claim 91 is also a dependent claim of claim 90 and further teaches a heating controller for controlling the heating system to keep the liquid in the chamber between a first temperature and a second temperature and a pressure controller for controlling the generation of the pressurized steam for delivering the liquid pulse. Some of the support for this claim may be found in Page 5, lines 14-16; Page 8, lines 20-28 and Page 9, lines 11-21 of the application.

22. Claim 92 teaches a liquid pulse generator having a liquid chamber for receiving liquid from a reservoir via an inlet valve, a pressurization chamber having a heating system for generating pressurized steam and a steam outlet for directing the pressurized steam to a first end of the liquid chamber to deliver the liquid in the liquid chamber out of a liquid intake port as a pressurized pulse to a utilization station, and at least one partition for separating the pressurization chamber from the liquid chamber. The inlet valve has a valve opening and a seal member for opening the valve opening to allow liquid in the reservoir to refill the liquid chamber after the delivery of the pressurized liquid pulse and to prevent the reverse flow during the delivery.

The liquid in the liquid chamber is at a temperature between its boiling point and room temperature suitable for use in the utilization station. The partition prevents the pressurized steam generated in the pressurization chamber from interacting or mixing with the liquid in the liquid chamber. As a result,

the liquid between the first and second ends in the liquid chamber will not be overheated by the pressurized steam or the heating system during the delivery of the pressurized liquid pulse. This also significantly increases the energy efficiency of the heating system in generating the pressurized steam and increases the speed of the pressurized liquid pulse at the liquid utilization station.

The earlier apparatus taught by Cai in US Patent Number 6,405,637 did not teach to use a partition to prevent the pressurized steam generated by the heating system from mixing with or heating the water in the liquid chamber during the delivery of the pressurized liquid pulse. As a result, the pressurized water pulse delivered by the apparatus taught by Cai'637 was found to be overheated, which may not be very suitable to certain applications such as coffee brewing that requires the water to be at an optimized temperature for the best extraction of the coffee grounds. In addition, the earlier apparatus taught by Cai'637 was found to be significantly slower in delivering the pressurized water pulse than the present invention, most likely because in the earlier apparatus some of the pressurized steam was wasted at heating the liquid in the liquid chamber. Clearly, the present invention has overcome two major obstacles, i.e. the overheating of the liquid in the pressurized liquid pulse and the slow or inefficient delivery of the liquid pulse, to the commercialization the earlier apparatus taught by the inventor in Cai'637.

To help advance prosecution, some of the support for this claim may be found in Page 4, lines 14-32; Page 5, lines 1-30; Page 7, lines 23-34; Page 8, lines 1-12; Page 9, lines 27-31; Page 11, lines 12-22; Page 8, lines 6-34; Page 15, lines 1-20 and Figs. 1, 2, 4, 6 and 8 of the application.

23. Claims 93-97 are dependable claims of claim 92.

Claim 93 further teaches to include a supply of liquid having substantially lower vapor pressure than water for said pulse generator. The lower vapor pressure means that the liquid has higher boiling point than water, thus reducing the heating of the liquid in the liquid chamber by the pressurized steam. Some of the support for this claim may be found in Page 9, lines 27-31 and Page 16, lines 24-25 of the application.

Claim 94 further teaches to include a supply of liquid that is not soluble in water for the apparatus. Such insolubility was found to minimize the heating of the liquid in the liquid chamber by the pressurized steam. Some of the support for this claim may be found in Page 9, lines 27-31 and Page 16, lines 24-25 of the application.

Claim 95 further teaches an opening between the liquid chamber and pressurization chamber to allow the liquid in the liquid chamber to flow into the pressurization chamber after the delivery of the pressurized liquid pulse by the pressurized steam. Some of the support for this claim may be found in Page 5, lines 26-30; Page 6, lines 3-7 and 17-19; Page 10, lines 1-4 and Figs. 1 and 4 of the application.

Claim 96 further teaches a steam director located at the first end of the liquid chamber for minimizing the interaction of the pressurized steam with the liquid in the liquid chamber when the pressurized steam is introduced to the liquid chamber from the pressurization chamber. Some of the support for this claim may be found in Page 5, lines 9-10 and 28-30; Page 6, lines 21-28; Page 10, lines 1-4; Page 11, lines 12-22; and Figs. 1, 4, 6 and 8 of the application.

Claim 97 is also a dependent claim of claim 96 and further teaches that the steam director comprises a distribution chamber, a plate for the distribution chamber and a plurality of openings on the plate for distributing the pressurized steam to the liquid in the liquid chamber. Some of the support for this claim may be found in Page 6, lines 17-28 and Figs. 1 and 6 of the application.

Please feel free to call me at 360 833-9822 (office) or 360 608-4127 (cell) in case you need to contact me for any prosecution purposes.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Edward Z. Cai', with a long horizontal flourish extending to the right.

Edward Z. Cai, Ph.D.

Applicant